

who were among the first inhabitants of America. This possibility is suggested by their cranial similarity to early populations in the eastern and southwestern United States. Brachycephalic low-heads seem to conform to the South American Tropical Forest cultures and to Arawak, Caribbean, and neighboring languages, but there are no linguistic parallels to North America.

It is obvious that a successful matching of race, language, and culture, even on the broadest sort of basis, cannot be carried out for all parts of the Americas. Yet the correspondences which obtain among three major linguistic and cultural groups of northern North America are a strong argument for separate migrations from Asia as an explanation of the physical variability among these three. If this be accepted, then the probabilities are high that the physical, linguistic, and cultural diversity that confronts us farther to the south is at least in part explainable by separate and ancient migrations although we can no longer follow the multiple and complexly interwoven threads of the fabric.

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PALEONTOLOGY.—*Two new Lower Cretaceous lituolid Foraminifera*.¹ ESTHER R. APPLIN, ALFRED R. LOEBLICH, JR., and HELEN TAPPAN, U. S. Geological Survey and U. S. National Museum.

During the course of a study of the genus *Choffatella* in the subsurface Cretaceous of Florida, by Applin and Jordan, comparisons were made with forms that had been referred to this genus from the Walnut clay (Fredericksburg group) and the Glen Rose limestone (Trinity group) of Texas. A close

examination disclosed that the Texas specimens were not true *Choffatella* and in fact represented two genera, neither of which could be referred to any previously described genus. These two genera and the type species are here described.

The material used in the present study was collected independently by Applin and by Tappan and Loeblich. Illustrations are camera-lucida drawings.

¹ Published by permission of the Director of the U. S. Geological Survey and the Secretary of the Smithsonian Institution. Received November 9, 1949.

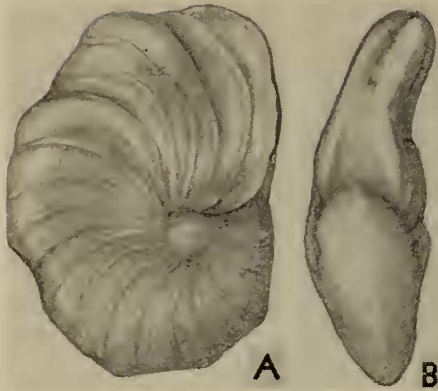


FIG. 1.—*Stomatostoecha plummerae* Applin, Loeblich, and Tappan, n. gen., n. sp.: A, Side view of holotype (U.S.N.M. no. 106219), showing numerous low chambers and raised and thickened sutures; B, edge view, showing lenticular, biumbonate test, and series of apertural pores at the peripheral margin of the apertural face. $\times 41$.

Family LITUOLIDAE

Subfamily ENDOTHYRINAE

Stomatostoecha Applin, Loeblich, and Tappan, n. gen.

Genotype.—*Stomatostoecha plummerae* Applin, Loeblich, and Tappan, n. sp.

Diagnosis.—Test free, planispiral, not completely involute; chambers numerous; wall calcareous, imperforate, microgranular, with some additional detrital material incorporated in the epidermal layer, interior simple, not labyrinthic, and with neither transverse nor parallel partitions; aperture a single series of pores in a linear depression on the apertural face of the final chamber.

Remarks.—*Stomatostoecha* differs from *Choffatella* in the absence of any transverse or parallel partitions, although they are related, as shown by the planispiral character and similar apertures. *Stomatostoecha* differs from *Pseudocyclammīna* in lacking the “labyrinthic” layer and from *Meandropsina* both in lacking the transverse and parallel partitions and in lacking the cyclical arrangement of chambers in the later stages. It differs from *Cyclammīna* in the absence of a “labyrinthic” interior and in having a single row of apertural pores rather than numerous pores scattered over the apertural face.

Although both *Stomatostoecha* and the following new genus seem closely related to members of the Lituolinae, such as *Choffatella*, *Pseudocyclammīna*, and *Cyclammīna*, we have placed our new genera in the subfamily Endothyriinae because of the absence of a labyrinthic interior. They are apparently transitional between the Endothyriinae and Lituolinae, however.

Stomatostoecha plummerae Applin, Loeblich, and Tappan, n. sp.

Figures 1-3

Choffatella sp. aff. *C. decipiens* Schlumberger, Adkins, Texas Univ. Bull. 3232: 333. 1932.

Test free, large, planispiral, and involute in most specimens, although a few become somewhat evolute in the later stages, lenticular, biumbonate, periphery bluntly rounded; chambers numerous, low and broad, ranging from as few as 11 in small specimens to as many as 20 in the last whorl of large, well-developed specimens, as many as $2\frac{1}{2}$ whorls commonly developed,



FIG. 2.—*Stomatostoecha plummerae* Applin, Loeblich, and Tappan, n. gen., n. sp.: Outline drawings of exterior of paratypes (U.S.N.M. nos. 106220a-d), showing variations in size and outline. $\times 41$.

with the earlier whorls covered by the later chambers; sutures slightly curved, thickened and generally raised, at other times somewhat obscure; wall thick, calcareous, imperforate, microgranular, with some additional detrital material incorporated in the epidermal layer, the amount of agglutinated material varying somewhat with the nature of the enclosing sediments, interior simple, not labyrinthic, and with neither transverse nor parallel partitions; aperture a single series of pores in a linear depression on the apertural face of the final chamber, extending from the peripheral angle about one half the length of the apertural face.

Greatest diameter of holotype 1.20 mm, least diameter 0.94 mm, greatest thickness 0.36 mm. Other specimens range from 0.44 to 1.59 mm in greatest diameter.

Remarks.—In addition to the distinct generic characters mentioned above, the present species differs from *Choffatella decipiens* Schlumberger in being about one half as large and in being lenticular in section, rather than compressed.



FIG. 3.—*Stomatostoecha plummerae* Applin, Loeblich, and Tappan, n. gen., n. sp.: Camera lucida drawing of thin section of paratype (U.S.N.M. no. 106228), showing thickened walls and absence of accessory structures. $\times 48$.

Although the Lituolidae are generally regarded as arenaceous in character,² the present writers agree with the conclusion reached by Henson³ that many of the genera are essentially calcareous. In a discussion of the type species of *Choffatella*, Henson stated that "sections show that the walls contain very little arenaceous material, and in some specimens none at all is perceptible under the microscope; the essential nature of the shell

² CUSHMAN, J. A., *Foraminifera, their classification and economic use*, ed. 4: 100. 1948.

³ HENSON, F. R. S., *Larger imperforate Foraminifera of southwestern Asia*: 14. British Mus. Nat. Hist., 1948.

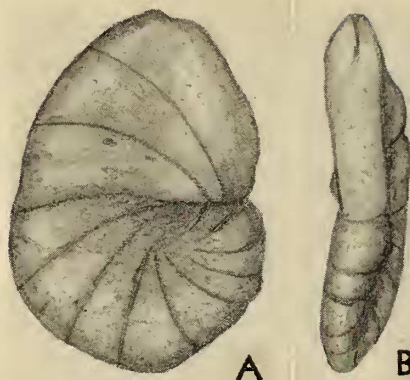


FIG. 4.—*Phenacophragma assurgens* Applin, Loeblich, and Tappan, n. gen., n. sp.: A, Side view of holotype (U.S.N.M. no. 106225), showing sub-ovate outline, wedge-shaped chambers, and slightly evolute character; B, edge view, showing flattened form and short slitlike aperture at the peripheral angle. $\times 72$.

material is calcareous, imperforate, and microgranular, but the tests rarely have that milky-white appearance which is characteristic of nonarenaceous, imperforate foraminifera. It is probable, therefore, that a certain amount of argillaceous impurity is contained in the interstices between the calcite crystals of which the walls are composed." The wall structure of the present new genera was studied under a petrographic microscope, and appeared granular, but there was no evidence of any agglutinated fragments except in the outermost layer, the calcareous material forming the largest portion of the wall.

Types and occurrence.—Holotype (U.S.N.M. no. 106219), figured paratypes (U.S.N.M. nos. 106220a-d), and unfigured paratypes (U.S.N.M. no. 106221) from the Walnut clay, just below the *Dictyoconus walnutensis* (Carsey) bed in a small quarry on the north side of the Hickmuntown-Mansfield Dam road, 1.6 miles by road southwest of Hickmuntown, Travis County, Texas, collected by A. R. Loeblich, Jr.; unfigured paratypes (U.S.N.M. no. 106222) from the Walnut clay, just below the *Dictyoconus walnutensis* (Carsey) ledge on the south side of Mount Barker, about 3.5 miles (air line) northwest of the Capitol Building in Austin, Travis County, Texas, collected by A. R. Loeblich, Jr., figured thin section (U.S.N.M. no. 106228) from E. R. Applin collection from the same locality; unfigured paratypes (U.S.N.M. no. 106223) from the Walnut clay, in a low exposure on the south side of the road, 0.6 mile by road west of the crossing of the Missouri

Pacific Railroad, on the Bull Creek road, northwest of Austin, Travis County, Texas, collected by Helen Tappan and A. R. Loeblich, Jr.; unfigured paratypes (U.S.N.M. no. 106224) from the Glen Rose limestone (zone of *Salenia texana*), 440 feet below the top, in a road cut on U. S. Highway 281, 1.2 miles north of the junction with Texas State Highway 46, Comal County, Texas, collected by A. R. Loeblich, Jr.

Phenacophragma Applin, Loeblich, and Tappan, n. gen.

Genotype.—*Phenacophragma assurgens* Applin, Loeblich, and Tappan, n. sp.

Diagnosis.—Test free, planispiral, somewhat evolute, with a slight tendency to uncoil; chambers numerous; septa of two types, the complete normal septa alternating with shorter partitions which project only slightly into the chamber cavities; wall calcareous, imperforate, and microgranular, with some additional material incorporated in the epidermal layer, interior simple, not labyrinthic, and with no transverse partitions; aperture slitlike, terminal, on the final chamber.

Remarks. — *Phenacophragma* differs from *Pseudocyclammia* in lacking the labyrinthic interior and cribrate aperture and in possessing the short intercalary septa. It differs from *Stomatostoecha* in possessing the secondary septa and in having a single slitlike aperture, rather than a series of pores.

Phenacophragma assurgens Applin, Loeblich, and Tappan, n. sp.

Figures 4-6

Test free, large, ovate in outline, flattened, planispiral and slightly evolute, so that previous whorls may be seen in the umbilical region, later chambers tending to uncoil, periphery subacute; chambers numerous, from 12 to 15 present in the last whorl, about $2\frac{1}{2}$ whorls usually developed, chambers low and broad; sutures straight or slightly curved, flush or slightly depressed, although occasional collapsing of the walls allows them to appear raised, the intercalary septa only about one third to one fourth as long as the other septa as seen in thin-sections, occasionally curved backwards, may at times be reflected externally

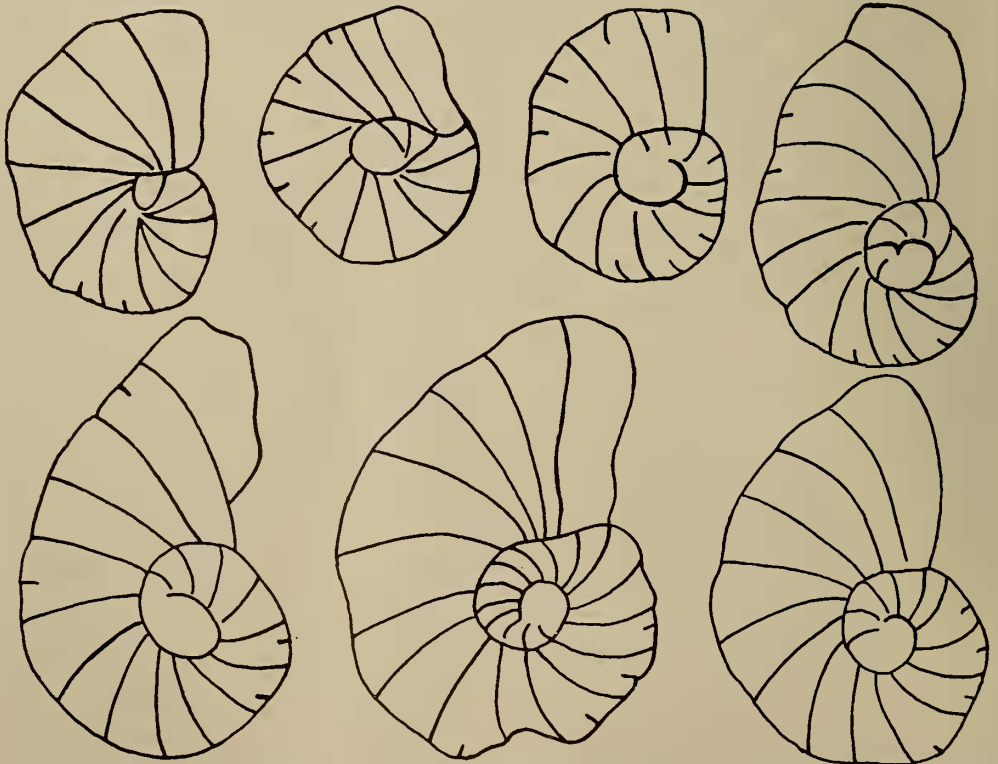


FIG. 5.—*Phenacophragma assurgens* Applin, Loeblich, and Tappan, n. gen., n. sp.: Outline drawings of exterior of paratypes (U.S.N.M. nos. 106226a-g), showing variation in size and outline, somewhat evolute test, tendency of the later chambers to uncoil, and occasionally visible intercalary septa. $\times 72$.

although they are not as distinct as the normal septa when viewed from the exterior; wall calcareous, imperforate and microgranular, with some additional material incorporated in the epidermal layer, interior simple, not labyrinthic, and with no transverse partitions; aperture at the peripheral angle, consisting of a single slit which extends a short distance down the apertural face.

Greatest diameter of holotype 0.65 mm, least diameter 0.49 mm, greatest thickness 0.16 mm. Other specimens range from 0.47 to 0.86 mm in greatest diameter.

Remarks.—In addition to the different generic characters enumerated above, this species may be distinguished from *Stomatostoecha plummerae*, n. sp. by its being slightly smaller, in being flattened rather than lenticular and biumbonate, and in having a more pronounced tendency to uncoil in the later stages. The chambers are less numerous, and are not as low and broad, but may even appear wedge-shaped, and the septa are much thinner and are straighter. *Phenacophragma assurgens* also differs from *Choffatella decipiens* Schlumberger in being about one third as large, in having less numerous chambers, and in lacking the labyrinthic interior and multiple aperture.

Types and occurrence.—Holotype (U.S.N.M. no. 106225), figured paratypes (U.S.N.M. nos. 106226a-g), and unfigured paratypes (U.S.N.M.

no. 106227) from the Glen Rose limestone, 520 feet below the top, in a road cut on the east side of U. S. Highway 281, 2.4 miles north of the junction with Texas State Highway 46, Comal County, Texas, collected by A. R. Loeblich, Jr.; figured sectioned paratype (U.S.N.M. no. 106229) from E. R. Applin collection from the same horizon and locality.

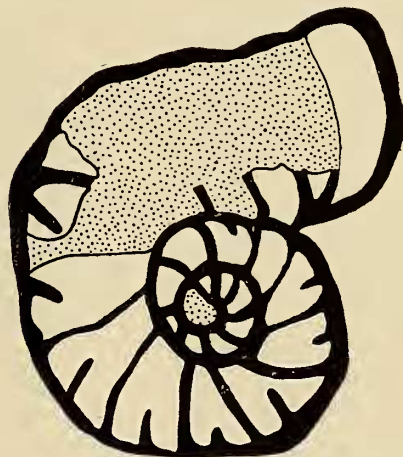


FIG. 6.—*Phenacophragma assurgens* Applin, Loeblich, and Tappan, n. gen., n. sp. Camera-lucida drawing of thin section of paratype (U.S.N.M. no. 106229), showing alternation of normal and intercalary septa and more delicate wall structure than in *Stomatostoecha plummerae*. $\times 95$.

ENTOMOLOGY.—*Additional illustrations and notes on Aedes bambusicolus Knight and Rozeboom.*¹ EDWARD S. ROSS, California Academy of Sciences. (Communicated by ALAN STONE.)

Aedes (Stegomyia) bambusicolus Knight and Rozeboom² was described from one of two male specimens reared from a bamboo stump on Culion Island, Philippine Islands, June 20, 1945. The female, larva, pupa, and biology have not yet been described. During June 1945, the writer collected a small series of this species near San José, Mindoro, and secured adult-associated larval and pupal skins. In view of the remarkable nature of the early stages of the species, it seems desirable to publish the present illustrations and notes at this time.

Male.—Discrepancies in the terminali figure published by Knight and Rozeboom

(pl. 10, fig. 8) and the one presented here (Fig. 1) will be noticed. These are apparently due to the fact that the former was drawn from a crushed slide preparation, which exhibits the various structures spread apart and the ordinarily dorsally directed inner setae of the basistyle in profile. The scales of the basistyle were also apparently intentionally omitted. My illustration is based on an uncrushed preparation and shows the various structures and inner setae in the true relation and perspective. These setae appear to be much shorter than they actually are because of the foreshortened representation. The disadvantage of each of these methods of mounting genitalia can be overcome by using the figures in a supplementary manner.

Not noted in the original description is a

¹ Received October 29, 1949.

² KNIGHT, K. L., and ROZEBOOM, L. E. *The Aedes (Stegomyia) albolineatus group (Diptera, Culicidae)*. Proc. Biol. Soc. Washington 59: 94, pls. 9, 10. 1946.